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GB 000004264 A
NOV 1877

No. 4,264
British 1877
Nov. 14, 1877

Metal,
Sheet Metal and Wire.

A.D. 1877 Nov 14 N°4264.
HUTCHINGS & JOHN'S, Specific

FIG.2.

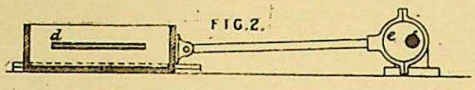



FIG.1. & 2.

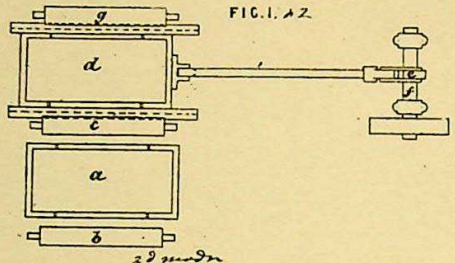
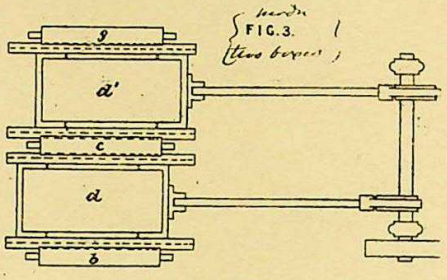



FIG.3. Modn (Uses beyond)




29 modn
FIG.4. & 5

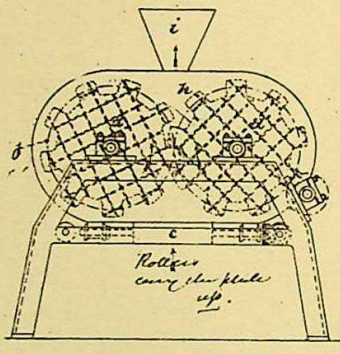



FIG.5.

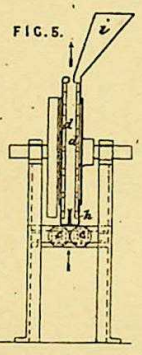



FIG.8. & 9 Modns 3 & 4

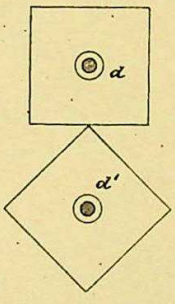



FIG.9.

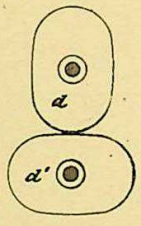



FIG.11. & 12 - Modn 5.
From, Sand Rock; Mother of coal; crushed lime,

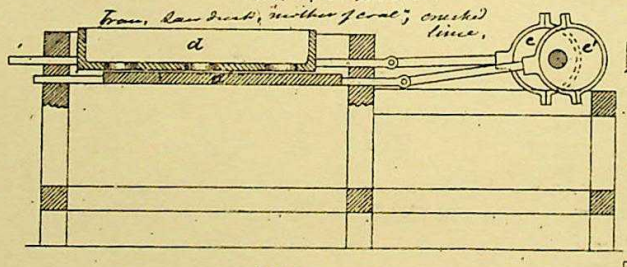



FIG.6. & 7
3d modn

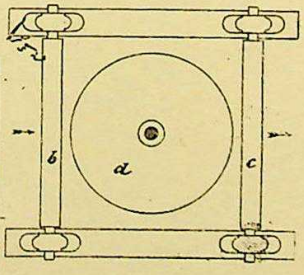



FIG.10.

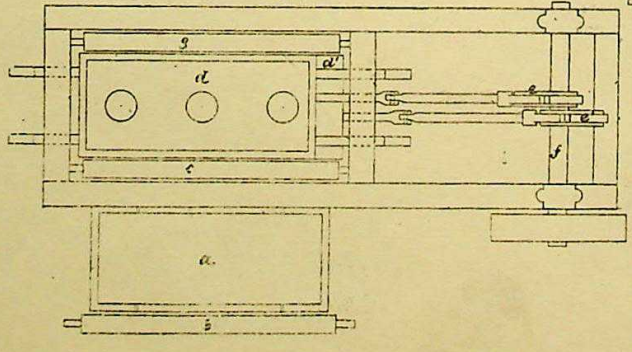
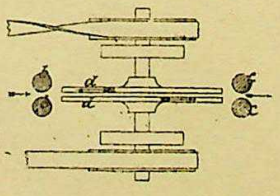



FIG.7.

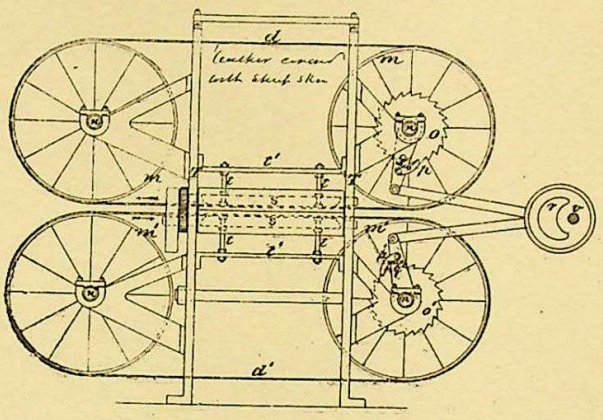


Metal),
Sheet Metal and Wire.

A.D.1877. Nov. 19. 4264.
HUTCHINGS & JOHN'S. SPECIFICATION

(2 SHEETS)
SHEET 2.

FIG. 12. 2, 3 Mode 6




Mode 8
FIG. 16.
Hand and horse combined

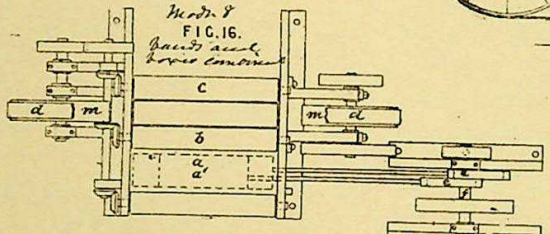



FIG. 13.

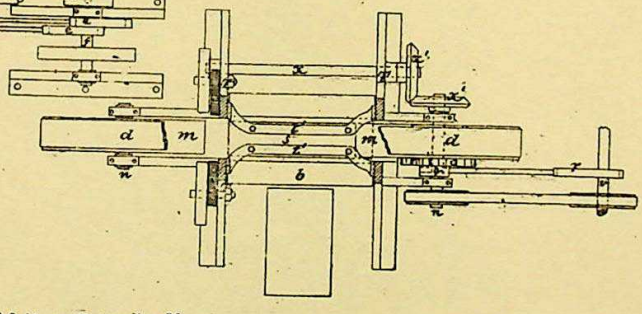



FIG. 14. 2, 15 Mode 7

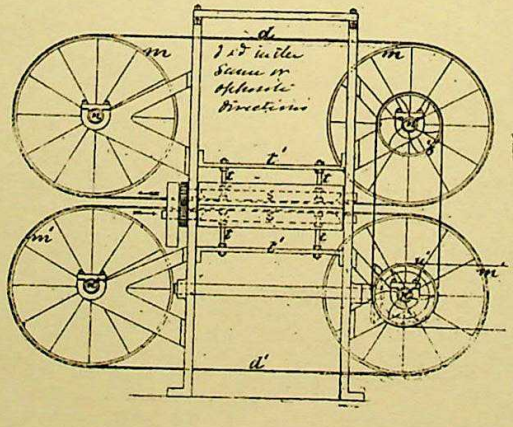
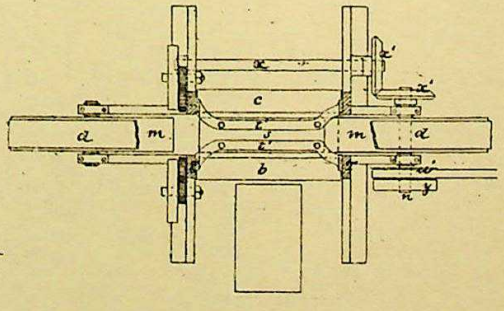



FIG. 15.



S M + W

Cleaning tin + terne plates

A.D. 1877, 14th NOVEMBER. N° 4264. W

Refers to A D 1877 No 1892

# Cleaning Metal Plates.

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LETTERS PATENT to Richard James Hutchings and Thomas John, both of Treforest, in the County of Glamorgan, for the Invention of "IMPROVEMENTS IN APPARATUS OR MACHINERY FOR CLEANING TIN, TERNE, AND OTHER METAL PLATES."

Sealed the 15th February 1878, and dated the 14th November 1877.

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PROVISIONAL SPECIFICATION left by the said Richard James Hutchings and Thomas John at the Office of the Commissioners of Patents on the 14th November 1877.

RICHARD JAMES HUTCHINGS and THOMAS JOHN, both of Treforest, in the County of Glamorgan. "IMPROVEMENTS IN APPARATUS OR MACHINERY FOR CLEANING TIN, TERNE, AND OTHER METAL PLATES."

According to one arrangement, in a suitable trough, box, or other receptacle, or several of such troughs, boxes, or other receptacles, made of wood, iron, or other convenient material or materials, we place bran, crushed lime, or a combination of same, or other material suitable for cleaning tin plates, and into this receptacle or receptacles we introduce the plates to be cleaned through apertures in the same, or by the top, or in any other convenient way.

In the receptacles, or preferably just outside same, we provide rollers covered or not with rubber or other suitable material; wood rollers will answer the purpose, having rings of rubber or other suitable material thereon at suitable distances apart, and just sufficiently far apart to grip the plate or plates passing to the rollers. Beyond these latter rollers the plates aforesaid are guided through guides or apertures into another box or receptacle, also containing cleaning material as before, such as bran, and this box or receptacle has a reciprocating motion imparted to it by cams, cranks, or other mechanical equivalents, thereby keeping the bran in motion, and thus continually cleaning the bran which comes in contact with or is presented to the surface of the plates to be cleaned which pass through this reciprocating box.

[*Price* 6*d*.]

There may be only one or there may be several reciprocating boxes, and we wish it to be distinctly understood that we do not limit ourselves to the number of receptacles fitted as aforesaid. When there are several reciprocating receptacles, each must be provided with suitable guides to receive the plates as they come from the preceding receptacle.

The plates after leaving the last reciprocating receptacle are passed between polishing rollers for removing the dust.

Apertures or valves may be provided in the receptacles for the escape of cleaning material, or for the supply of fresh, as may be required.

Sometimes, instead of the boxes having a reciprocating motion imparted to them, the rollers may have the said reciprocating motion imparted to them, or in combination with reciprocating receptacles; when the rollers have a to-and-fro motion alone, the receptacles would be stationary.

According to another arrangement we clean tin, terne, or metal plates by passing the said plate or plates to be cleaned between a pair or pairs of wheels or sheaves, or a pair or pairs of friction wheels or rollers of suitable material or materials; these wheels, sheaves, or rollers, are worked inside a box or boxes, or any suitable receptacle or receptacles, the plates to be cleaned being introduced through apertures on the top or side of this receptacle or receptacles, which will be charged with bran or any suitable polishing material or combination of materials. Into one or more of these receptacles we introduce gas, or heat, or steam, for the purpose of heating the bran or cleaning material or materials through which the plate or plates is or are passed, the cleaning and polishing material or materials being fed into the receptacle or receptacles by means of a hopper, trough, or pipe, or some suitable mechanism to press the cleaning and polishing material or materials against the surface of the plates while passing between the aforesaid pair or pairs of wheels, sheaves, or rollers.

Rolls or rollers may be used for carrying the plates into or passing them through the cleaning and polishing receptacle or receptacles, or they may be pushed into or through the cleaning and polishing receptacle or receptacles by hand, or partly through, and worked backwards and forwards, or may be carried through or partly through by any suitable mechanism. Guides may or may not be used for carrying and guiding the plates.

The cleaning and polishing sheaves, wheels, or rollers, or both sheaves, wheels, and rollers, may revolve when the plates are passing through, or rotate backwards and forwards; or the carrying rolls or rollers or guides may rotate or revolve backwards and forwards, and the cleaning and polishing sheaves, wheels, or rollers revolve, or both carrying rollers or guides may rotate, and the cleaning and polishing sheaves, wheels, or rollers, may rotate.

Gas, heat, or steam, is used only when required.

We do not confine ourselves to any particular number of receptacles, sheaves, wheels, or rolls, or rollers or guides, or hoppers, feeders, or troughs. A heated chamber may be used, also rolls or rollers covered with sheep-skin or suitable material for dusting the plate or plates.

The arrangements and apparatus before described may be used alone or in combination wholly or in part with the arrangements and apparatus described in the Specification of a Patent for cleaning plates, granted to Richard James Hutchings one of the aforesaid petitioners, dated 12th June 1876, No. 2421.

*Hutchings & John's Improvements in Apparatus for Cleaning Metal Plates.*

SPECIFICATION in pursuance of the conditions of the Letters Patent filed by the said Richard James Hutchings and Thomas John in the Great Seal Patent Office on the 14th May 1878.

RICHARD JAMES HUTCHINGS and THOMAS JOHN, both of Treforest, in the County of Glamorgan. "IMPROVEMENTS IN APPARATUS OR MACHINERY FOR CLEANING TIN, TERNE, AND OTHER METAL PLATES."

The object of this Invention is to clean tin, terne, and other metal plates, by means of apparatus having moving parts, so constructed and actuated as to continually clean or change about the bran or other cleaning material in contact with or presented to the surfaces of the plates to be cleaned, and so that in certain cases the moving part of the apparatus for cleaning one side of a plate shall be moving in the opposite direction to the moving part for cleaning the other side of the plate.

In order to shift and thus clean or change the bran or other cleaning material, we may also apply projections or recesses on flat moving parts, between which the plates to be cleaned are passed. As described in the Patent Specification of Richard James Hutchings, one of the aforesaid Patentees, dated 12th June 1876, No. 2421, the clips *c* on a horizontal or vertical drum *a* revolving in a vessel containing the cleaning material virtually serve to shift, and thus clean and change the cleaning material continually; but according to this present Invention, we apply such projections to flat moving surfaces. We may if desired cause the said flat moving surfaces to be moved backwards and forwards, or to be continuously, evenly, or intermittently moved relatively to one another.

According to one arrangement illustrated by Figure 1 which is a plan, and by Figure 2 which is a vertical longitudinal section, we place bran, saw dust, "mother of coal," crushed lime, or a combination of same, or other material suitable for cleaning tin or other plates in a suitable trough, box, or other receptacle *a*, and into this receptacle (or it may be two or more such receptacles one after the other) we introduce the plates to be cleaned through an aperture in one side in the arrangement here shewn, or it may be by the top or through the bottom, if the construction of the machine is opposite to that here shown, that is, vertical instead of horizontal), or in any other convenient way, according to the construction of the machine.

In the receptacle *a*, or preferably just outside the same as here shown, we provide a pair of feed rollers *b*, *b*, working in bearings, and caused to revolve by hand or power. The rollers *b*, *b*, may be covered with felt or rubber, or other yielding material, for gently nipping the tin plates passing between them, and then feeding them into the apparatus; wood rollers will answer the purpose when provided with a coating as aforesaid, or with rings of rubber or other suitable material thereon at suitable distances apart, that is, so as to grip or nip the plate in, say, two or more places. Beyond these feed rollers *b*, *b*, the plate may if desired be guided through guide appliances, which may be a pair of rollers *c*, *c*, into another box or receptacle *d*, also containing cleaning material as before, such as bran; this box *d* receives reciprocating movement. The rollers *c*, *c*, are caused to revolve by hand or power in unison with the feed rollers *b*, *b*. Beyond the reciprocating box *d* a pair of rollers *g*, *g*, may be provided for guiding the plate out of the machine.

We line the apertures in the sides of the boxes *a* and *d* with some hard and perfectly smooth material, such as glass or polished metal, or with a soft yielding material, such as leather, the object in all cases being to prevent the surface of the plate from being scratched. The box *d* has a reciprocating motion imparted to it by an eccentric *e* on a revolving shaft *f*, or by a cam, crank, or other mechanical equivalent, so that the bran or other cleaning material is thereby kept in motion or shifted, so as to be cleaning itself against those of its own particles which have not been made dirty or unfit.

Instead of one cleaning reciprocating box, we may employ two or more such, each provided with suitable guiding appliances to receive the plates as they come from the

preceding receptacle. The plate may be fed into a reciprocating box at once, instead of first passing through a stationary box *a*.

Figure 3 shows a plan of an arrangement according to which we employ two reciprocating boxes *d* and $d^1$, both worked by eccentrics or by other means in opposite directions, as shown; *b*, *b*, are a pair of rollers for feeding the plate into and through the box *d*, and *c*, *c*, a pair of rollers for guiding the plate into and through the box $d^1$.

The plates after leaving the last reciprocating receptacle are passed between polishing rollers for removing the dust; these rollers may be covered with sheep-skin. The guide rollers *g*, *g*, may be the polishing rollers, or may serve to guide the plate to such polishing rollers.

Apertures or valves may be provided in the receptacles for the escape of cleaning material, or for the supply of fresh, as may be required, thus a hopper may be placed above and receive a shaking movement, or be provided with any well-known appliance for causing a slight continuous flow of cleaning material to the reciprocating receptacle below it.

Sometimes, instead of the boxes or receptacles having a reciprocating motion imparted to them, the rollers may have the said reciprocating motion imparted to them, or in combination with reciprocating receptacles. When the rollers have a to-and-fro motion alone, the receptacles would be stationary, the plate to be cleaned would then by rollers be passed through or partly through the receptacle, and rollers on the other side guide it back, self-acting or other means being provided for reversing the motion of the rollers.

According to another arrangement we clean tin, terne, or metal plates by passing them between the flat surfaces of a pair or pairs of sheaves or discs working inside a box containing cleaning material; Figure 4 is a side elevation, and Figure 5 a vertical section through an apparatus made according to this part of our Invention, and fitted with two such pairs of sheaves or wheels *d*, *d*, $d^1$, $d^1$, which are worked inside a box or receptacle *h*. The cleaning or polishing material may be fed into the receptacle *h* by means of a hopper *i*, or trough, or pipe, or by some mechanism, such as a small Jacob's ladder, in order to press the bran or other cleaning material against the surface of the plate, and keep it in a dense condition, also to make up for any small waste by escape at the bottom of the receptacle *h*.

The plate to be cleaned is fed into the apparatus by means of rollers *c*, *c*, which carry the plate up, and pass it between the pairs of wheels or sheaves *d*, or the plate may be pushed into or through the cleaning apparatus by hand, or partly through, and worked backwards and forwards; or they may be carried through or partly through by any suitable mechanism. The pairs of sheaves revolve in opposite directions to each other, and that either by continuous, even, or intermittent reciprocating movement.

In order to change the particles of the cleaning material we prefer to make the edge or circumference of the sheaves of a scolloped or tooth-like shape, as shown, and so as to interlock, or so to say, gear into each other, though not necessarily to touch one another.

The inner faces of the sheaves may be made plain, or with grooves or recesses as shown, or covered with pieces of sheep-skin entirely, or leaving narrow uncovered spaces for retaining and carrying along, and thereby shifting the particles of bran or other cleaning material. The pairs of sheaves are moved in opposite directions by tooth wheels *j* gearing into each other, and impelled by a pinion or in any other suitable manner.

Instead of a continuous revolving movement in opposite directions when the plates are passing through, we may make the sheaves rotate or oscillate backwards and forwards by crank or cam gear or equivalent mechanism, for giving reciprocating motion.

The sheaves actuated as described may be used without cleaning material, the faces being covered with sheep-skin or other suitable wiping material.

Figure 6 is a plan, and Figure 7 a cross section of an arrangement of one pair of sheaves $d$ to be placed in a box containing cleaning material, the plate passing between them; $b$, $b$, are feed rollers, and $c$, $c$, guide rollers on the exit side. The sheaves may be arranged to work horizontally, or in any other direction.

Figures 8 and 9 show two other arrangements of two pairs of sheaves $d$, $d$, and $d^1$, $d^1$, which are so formed as to nearly touch each other several times during one revolution, for the purpose of moving about or shifting the cleaning material, and thus as before described constantly presenting clean particles to the surfaces to be cleaned.

It is obvious that numberless other forms of sheaves may be devised for the same object, and operating as here set forth.

Figure 10 is a plan, and Figure 11 a sectional view of a modified arrangement of flat reciprocating appliances, operating on the same principle as the aforesaid sheaves. The plate is first by means of a pair of rollers $b$, $b$, fed into a box $a$ containing cleaning material, and is thence by the rollers $c$, $c$, fed in between two reciprocating boxes, plates, or frames $d$ and $d^1$ moving in opposite directions, one serving to clean the upper side of the plate, and the other serving to clean the lower side of the plate. Or the box $a$ may be omitted and the plate passed directly in between the boxes or frames $d$, $d^1$; these latter receive continuous reciprocating motion in opposite directions from eccentrics $e$, $e^1$, on a revolving shaft $f$, or they may receive intermittent reciprocating movement, say, by pawl wheel and pawl appliances. The sheep-skin or other surfaces of the plates or boxes $d$, $d^1$, are formed with parts recessed or otherwise with parts uncovered by sheep-skin; we thereby cause more motion or change of particles than if the surfaces were plain or uninterrupted throughout.

Figure 5 shews the sheep-skin or other surface left out or recessed in several parts.

Figure 12 is a side elevation, and Figure 13 a plan of an apparatus with reciprocating appliances presenting flat surfaces moving in opposite directions, the plate to be cleaned being passed between the said reciprocating appliances by feed rollers worked by hand or power; $d$ and $d^1$ are two endless bands of leather covered on the outside with one or more layers of sheep-skin; they are passed round the drums $m$, $m$, and $m^1$, $m^1$, which are loose on their spindles $n$ and $n^1$, which work in bearings on a frame. To one of the drums $m$ and one of the drums $m^1$ are fixed pawl wheels $o$ and $o^1$; $p$, $p^1$, are pawls mounted on levers $q$ and $q^1$ respectively, which are loose on the spindles $n$ and $n^1$, and receive reciprocating movement from an eccentric $r$ and revolving spindle $v$, as one is below the centre of its fulcrum, and the other above the same, the pawl wheels and consequently the drums $m$, $m$, and $m^1$, $m^1$, receive gradual intermittent rotary movement in opposite directions, the bands $d$ and $d^1$ thus obtain a gradually progressing movement in opposite directions; the plate to be cleaned being passed between the two sheep-skin covered endless bands are cleaned thereby.

The whole, or as here shown, part of the apparatus, may be enclosed in a box supplied with bran or other cleansing material as shown.

In order to insure a sufficient scouring or wiping action, especially when no cleaning material is used, and the wiping of the plates is intended to be effected by contact with sheep-skin, we may hold the bands against the upper and under surface of the plate to be cleaned by means of bars $s$, $s$, which are held by screwed rods $t$, $t$, secured to the brackets or stretchers $t^1$, $t^1$, which are bolted to the side frames T, T, of the apparatus, and so that these bars $s$, $s$, by means of the nuts on the bolts $t$, $t$, can be adjusted as to position and distance apart; $b$, $b$, are feed rollers, and $c$, $c$, taking off rollers, serving the same purpose as in previous Figures. These rollers are worked in unison and in the proper directions by means of any suitable gearing, for instance as here shown, where the strap pulley $u^1$ on the spindle $n^1$ is worked from the driving shaft, the bevel gear wheels $x^1$, $x^1$, causing the spindle $x$ to revolve, whence revolving motion is transmitted by strap and wheel gearing to the rollers $b$ and $c$.

*Hutchings & John's Improvements in Apparatus for Cleaning Metal Plates.*

Figure 14 is a side elevation, and Figure 15 a plan of a modified arrangement, in which the two endless bands $d$ and $d^1$ are worked continuously in opposite directions as indicated by the arrows; or the bands may be worked in the same direction, and if desired at different speeds, the plate to be cleaned being passed in between them as before. The driving pulley $u^1$ receives revolving motion from some revolving shaft, and the strap pulley $y$ transmits the motion to the pulley $y^1$ on the spindle of the upper drum $m$.

Figure 16 is a plan of a combined apparatus, that is, the reciprocating boxes or plates, or frames $a$ and $a^1$, in combination with the endless bands $d$ and $d^1$, or so to say, the machines shewn at Figures 10 : 11, and 14 : 15, combined in one; generally speaking, the sheaves, reciprocating boxes or plates, and endless bands, may be arranged in a line separately or in one machine as desired.

Instead of one endless band below another, we may use two or more upper bands and two or more lower bands arranged respectively side by side at the upper and lower level, and moving intermittently or continuously each one in an opposite direction to its adjoining band or bands, we thereby cause the cleaning material to be thoroughly intermingled and shifted about. Some of the bands may be enclosed or pass through receptacles for cleaning material, and some may be arranged outside the said receptacles.

In all the apparatus described we prefer to work them quicker when intermittently than when continuously.

Gas, heat, or steam, may be let into the interior of the cleaning material in the boxes or receptacles as required for keeping the material warm when the grease on the plates, as sometimes happens, has been allowed to become thick or stiff; or a heated chamber or jacket may be applied around the box or receptacle.

And having thus described and ascertained the nature of this our Invention, we declare that we are aware that a pair of rollers having as it were only a line of contact, have heretofore been proposed to be applied to the cleaning of tin and other plates, but we claim the application of reciprocating or otherwise moving flat surfaces or appliances, so constructed and operating as to continuously present fresh parts or particles of cleaning material for cleaning tin and other plates, substantially as set forth.

In witness whereof, we, the said Richard James Hutchings and Thomas John, have hereunto set our hands and seals, this Eleventh day of May, in the year of our Lord One thousand eight hundred and seventy-eight.

RICHARD JAMES HUTCHINGS. (L.S.)
THOMAS JOHN. (L.S.)

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For Her Majesty's Stationery Office.

1878.